Badger Forest Restoration Project
Project Scoping
Lassen National Forest
Hat Creek Ranger District
Shasta County, California

The Lassen National Forest (LNF), in partnership with the Sierra Nevada Conservancy, is conducting environmental analysis of the Badger Forest Restoration Project. The project boundary encompasses approximately 40,000 acres in the Badger Mountain and Hat Creek/Old Station area.

PURPOSE AND NEED

The intent of the project is to reduce wildfire risk, promote forest health and diversity, protect resource values, and restore ecological processes.

Forest conditions dominated by high tree density and high fuel loads result from a history of long-term fire exclusion throughout much of the project area, contributing to an elevated risk of large, severe fires and increased mortality from insects and disease. The Reading Fire in 2012 burned approximately 12,000 acres of the project area with about 3,600 acres of high fire severity.

Restoration is the process of assisting the recovery of ecosystems that have been damaged, degraded, or destroyed. Ecological restoration re-establishes the composition, structure, and/or ecological processes that support sustainable ecosystems. The project objectives are to reduce fire risk by reducing fuel loadings and to improve forest health and diversity by restoring a more natural open forest structure.

PROPOSED ACTION

Hat Creek Ranger District of the LNF is proposing to conduct forest health and resilience treatments in the general area of Badger Mountain, the community of Old Station, Hat Creek, and Lost Creek. The project is located in Shasta County, California on the northern boundary of Lassen Volcanic National Park, extending 0.25 miles beyond State Highway 44 (Figure 1) in portions of Townships 31-33N, Range 4-6E, Mount Diablo Base and Meridian. The project is south and west of the Plum Restoration Project, decided in 2019, and has similar goals.

Elevations in the project area range between approximately 4,300-7,100 feet. The project area includes the following treatment categories: thinning for fire and forest health, plantation thinning, Highway 44 fuel break, wildlife habitat enhancement, wildlife habitat resilience, shrub habitat enhancement, prescribed fire only, and no active treatment.

Vegetation treatments will be designed to move from existing conditions to desired conditions, consistent with the Lassen National Forest land management plan, based objectives for the treatment category.

- **Restoration Thinning** objectives would focus on restoring vegetation conditions that are closer to the natural range of variation, improving forest health and fire resilience. Prescriptions would be based on forest vegetation types and the appropriate species for the site, increasing structural diversity, and reducing the potential for high-severity unplanned fire. Special prescriptions would apply to areas favorable to enhance or maintain black oak, aspen, and cottonwood.

- **Plantation Thinning** would be designed to increase structural diversity and increase fire resilience.

- **Highway 44 Fuel Break** would focus on reducing fire intensity adjacent to the highway to ensure safe passage during a wildfire and reducing hazards from falling trees, branches, ice and snow. The forest would be graded from more open near the highway to denser near the corridor edge.

- **Wildlife Habitat Enhancement** objectives would follow conservation strategies and forest plan guidance for core areas for the California spotted owl, goshawks, and fur-bearer corridors.

- **Wildlife Habitat Resilience** would allow more open forests while still maintaining larger trees with the objective of reducing the risk of high-intensity fire impacting wildlife activity centers. These areas serve to modify the restoration thinning prescriptions, based on larger-scale wildlife habitat resilience.

- **Shrub Habitat Enhancement** objectives are to rejuvenate decadent shrub stands to improve browse, improve song-bird nesting habitat, and increase the diversity of age-classes to maintain shrub populations using a combination of mastication and prescribed fire.

- **Prescribed Fire Only** would be used where fire can be safely used to reduce hazardous fuels and to rejuvenate shrubs and herbaceous plants without thinning beforehand.

- **No Active Treatment** would occur in areas of moderate to high severity fire within the Reading Fire perimeter that have been previously salvaged and in rocky, sparse areas. Fire may be allowed to back into these areas.

Activities would include mechanical and hand thinning, sanitation and hazard tree removal, biomass removal, mastication, and prescribed burning. Access to treatment areas would entail maintenance or reconstruction of existing Forest Service roads, and construction and decommissioning of temporary roads and landings. Existing roads that are not needed for future management may be decommissioned or reclassified. Two roads that are contributing to erosion and sedimentation (32N01X along Hat Creek and 31N93 to Hat Creek Falls) would be relocated to reduce these impacts and the culverts would be replaced where FS Road 32N13 crosses Lost Creek to eliminate a barrier to upstream movements.

Variable density thinning in natural stands would occur throughout most of the project area. In natural stands with slopes over 35 percent, only hand treatments would occur. A non-significant forest plan amendment would allow mechanized treatments in plantations over 35 percent slope. Wildlife habitat enhancement would occur in California spotted owl (*Strix occidentalis occidentalis*) and northern goshawk (*Accipiter gentilis*) protected activity centers and territories and fur-bearer corridors, using a modified prescription to reduce fire risk while leaving more late successional forest structure, as specified in the 2019 California Spotted Owl Conservation Strategy and forest plan guidance. Shrub enhancement will focus on rejuvenating decadent shrub stands to provide high quality browse for deer and elk and improve habitat for nesting birds. Other special prescriptions will be applied to aspen, cottonwood, and oak stands to enhance forest diversity. Prescribed fire only will occur in shrub and open forest stands where mastication or thinning is not feasible or desired. Rocky sparse areas and areas burned at moderate to high severity burn that were previously salvaged and planted within the Reading Fire will not be actively treated, though prescribed fire on adjacent treatments may be allowed to back into some of these area, based on operational expedience.

Variable Density Thinning

Thinning treatments to promote forest health, diversity, and resilience to fire, insects, and disease would follow a variable density thinning prescription, with the main goal being to reduce stand density and increase structural and species diversity in treated stands. Mechanical treatments would be limited to slopes less than 35 percent, except in existing plantations. Healthy, large trees will be favored for retention, subject to species and structural diversity needs and goals for reducing fire intensity.

To accomplish the variable density thinning, conifers less than 30 inches diameter breast height (dbh) would be harvested, leaving an uneven arrangement of individual trees, small groups or clumps, and openings within the stand. Trees with evidence of insect attacks, mistletoe, or root disease would be prioritized for removal. Healthy pine, Douglas-fir, red fir, and incense cedar would be prioritized for retention. Three to five snags and down logs per acre would be left for wildlife and soil cover. Small trees and tops would be chipped and sold as biomass, where feasible. Elsewhere, this material would be piled or scattered and burned. Prescribed fire would occur in all thinning treatments and may be repeated an average of 10 years after initial treatment.

Similar treatments would be applied to existing plantations, where the focus will be reducing the potential for insect infestations and stand-replacing fire. Marginal improvements to structural diversity would be achieved. A non-significant forest plan amendment would allow mechanical treatment in existing plantations with slopes greater than 35 percent. These are limited to plantations within the Reading Fire perimeter on the north and west slopes of Badger Mountain.

Special thinning prescriptions would focus on releasing black oaks and cottonwoods from conifer competition. Conifers up to 30 inches in diameter would be removed within an area based on the diameter of the target tree diameter in inches. To maintain aspen stands, conifers less than 30 inches would be removed from an area up to 150 feet beyond the outermost aspen stems.

Another special prescription area will include the Highway 44 fuel break. The primary focus around the highway corridor will be safety. The desired forest structure would limit flame lengths during a wildfire to allow safe ingress and egress. Hazard trees that may drop debris or ice and snow on the highway would be removed, including some trees that exceed 30 inches in diameter.

Hand thinning will occur in natural stands with slopes greater than 35 percent, or where mechanical thinning is impractical or infeasible (e.g., rocky, broken topography). Treatments would include hand-thinning and piling. Snags, small trees (under 10 inches diameter) and brush would be cut, piled and burned, or chipped and removed.

An undetermined number of temporary landings may be established or enlarged during project implementation. The size of the log landings varies depending on how much debris is generated, but typically average around ¼ to ½ acre.

Sanitation and Hazard Tree Removal

Diseased, dead and dying trees, and trees that are contributing to the spread of insects or disease in a stand would be felled and removed within the project area. Hazardous trees of any size that are threats to private homes, property boundaries, power lines, roads, landings, and other infrastructure—as defined by the Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (approved April, 2012)—would be felled. Larger snags (>12” dbh) that meet minimum specifications may be sold as sawlogs. Dead trees not meeting sawlog specification may be cut and removed and sold as biomass, left as downed wood, or burned. These treatments would generally be conducted at the same time as the thinning treatments.

Biomass Removal

Biomass treatments are a subset of variable thinning and entail the mechanical removal of non-merchantable trees (generally between 3” and 10” dbh). These trees would be removed as firewood, shavings logs, pulpwood, chipped for biomass fuel, or decked and left on site for future burning or public firewood cutting.

Mastication

Mastication (shredding) would be used to thin small trees (1 – 10” dbh) and decadent brush to increase the spacing between conifer trees, shred competing vegetation, and maintain tree diversity. Trees with evidence of mistletoe would be prioritized for removal. Healthy pine, Douglas-fir, red fir, incense cedar, and black oaks would be prioritized for retention.

Prescribed Burning

Prescribed fire is the intentional burning of vegetation under favorable conditions to reduce the density of trees and brush, reduce ladder fuels, and increase canopy height. Prescribed burning includes both pile and understory burning. It would occur at any time of year when conditions allow for consumption of surface fuels, using hand and aerial ignition for pile and understory burning. The use of prescribed fire is proposed here as a follow-up treatment after variable thinning or as a stand-alone treatment. Periodic reentry of prescribed fire would be used to maintain desired conditions.

One or more activities could occur within each treatment category to move toward desired conditions, based on the stand condition and allowed activities within the category. The table below depicts the treatment categories and activities that could occur within each.

Treatment Category	Potential Activities	Approximate Acres
Restoration Thinning	○ Mechanical Thinning ○ Hand Thinning (slopes over 35%) ○ Sanitation and Hazard Tree Removal ○ Biomass Removal ○ Mastication ○ Machine or Hand Piling ○ Prescribed Burning	17,240
Plantation Thinning	○ Mechanical Thinning ○ Sanitation and Hazard Tree Removal ○ Biomass Removal ○ Mastication ○ Machine or Hand Piling ○ Prescribed Burning	2,170
Highway 44 Fuel Break	○ Mechanical Thinning ○ Hand Thinning ○ Sanitation and Hazard Tree Removal ○ Biomass Removal	7,610

	○ Mastication ○ Prescribed Burning	
Wildlife Habitat Enhancement	○ Mechanical Thinning ○ Hand Thinning ○ Sanitation ○ Biomass Removal ○ Mastication ○ Prescribed Burning	2,910
Wildlife Habitat Resilience	○ Mechanical Thinning ○ Hand Thinning ○ Sanitation ○ Biomass Removal ○ Mastication ○ Prescribed Burning	8,460
Shrub Habitat Enhancement	○ Mechanical Thinning ○ Hand Thinning ○ Mastication ○ Biomass Removal ○ Prescribed Burning	800
Prescribed Fire Only	○ Prescribed Burning	500
No Active Treatment	○ Rocky, sparse areas ○ Previously salvaged areas within the Reading Fire perimeter ○ Fire may be allowed to back in	9,160

Non-Significant Forest Plan Amendments

The project will include two project-specific forest plan amendments. One amendment will allow mechanical treatments where slopes are greater than 35 percent in existing plantations on Badger Mountain. The second amendment will allow implementation of the forest treatment guides from the 2019 California Spotted Owl Conservation Strategy, instead of following the spotted owl guidance from the 2004 Sierra Nevada Framework plan amendment.